
The Urban American Indian Oversample in the 1988 National Maternal and Infant Health Survey

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Synopsis

Although more than two-thirds of American Indians and Alaska Natives (AI) live outside reservations and Tribal lands, few data sets describe social and maternal-child health risk factors among urban AI. The Indian Health Service sponsored a special effort to survey mothers of AI infants as part of the 1988 National Maternal and Infant Health Survey (NMIHS), a comprehensive national study conducted by the National Center for Health Statistics, Centers for Disease Control. The authors analyzed questionnaires completed by mothers residing in selected locations served by urban Indian health programs and compared the data with those for women of other races residing in metropolitan areas.

After adjusting the sample for nonparticipating States, the response rate in the Urban Indian Oversample was 60.8 percent (763 of 1,254). More than 45 percent of AI and black respondents, compared with 15 percent of white respondents, reported an annual household income of less than \$10,000. About half of AI and black women, compared with nearly three-quarters of white women, reported having insurance or health maintenance organization coverage during pregnancy. Despite having a similarly low rate of health insurance coverage and low household income, AI respondents were far less likely than black respondents to have Medicaid coverage. A higher proportion of AI women than of black or white women reported difficulties in obtaining prenatal care, and AI women were less likely to obtain prenatal care. AI women were also less likely than white women to obtain prenatal care in the first trimester. Although a similar proportion of AI and white women reported that they consumed alcohol during the year before pregnancy, a higher proportion of AI drinkers than of white drinkers reported consuming one or more drinks weekly after finding out they were pregnant. The proportion of unwanted pregnancies was higher among AI women than among white women, but lower than among black women. AI and black women had a higher prevalence of depressive symptoms than did white women.

The data suggest that urban AI mothers experience a disproportionate burden of economic, social, and behavioral risk factors for adverse pregnancy outcome. In spite of some data limitations, the Urban Indian Oversample of the NMIHS provides important information about social and health risk factors among urban AI mothers.

DESPITE A PRECIPITOUS FALL during the past three decades, infant mortality for American Indians and Alaska Natives (AI) continues to exceed that for the general population (1, 2).

Although in fiscal year 1990 about 14,000 infants were delivered in facilities operated by either the Indian Health Service (IHS) or sovereign Indian Tribes, or in non-Federal hospitals reimbursed by the

IHS, they represent fewer than one-third of the births of Indian children during the period. In 1990, more than two-thirds of AI women lived outside reservations, and more than one-sixth lived in cities of greater than 100,000 residents. Fewer than half of AI are registered for health care provided by the IHS, an agency of the Public Health Service, and most who use IHS services live on or near primarily rural Indian reservations or traditional Indian lands. Thus, in order to obtain a complete understanding of risk factors for poor pregnancy outcome among AI women, it is important to study AI women living in urban areas, as well as those living on or near reservations and traditional Indian lands.

In 1988, the National Center for Health Statistics (NCHS) conducted the National Maternal and Infant Health Survey (NMIHS) to provide researchers the opportunity to study factors related to poor pregnancy outcomes and to provide baseline data to monitor progress in achieving maternal and infant health objectives set by the Department of Health and Human Services for the Year 2000 (3). Because of the relative lack of data describing the process and outcomes of antepartum, intrapartum, and postpartum care among urban AI women, IHS sponsored an oversample of AI births in selected urban locations served by 35 Indian health programs. Those programs have been designated as urban by virtue of their location in a standard metropolitan statistical area, designated by the Bureau of the Census.

We describe the methods used to select the sample, report the survey response rates for the mothers' questionnaire, define the population for which data can be inferred based on the survey, and highlight selected topics that provide insight into the special characteristics of urban AI women compared with women of other races living in urban communities.

Methods

Sample selection. In 1988, 35 urban Indian health centers and 6 satellite clinics in 21 states received at least a portion of their funding from IHS. In the catchment areas of those clinics, 56 locations (43 counties and 13 cities) served as the frame for the selection of the study sample. The sampling frame consisted of certificates of live births from July 1, 1988, to December 31, 1988, on which the mother's or the father's race was recorded as American Indian, Aleut, or Eskimo, and the mother's residence was in one of the urban locations. Alaska was not included in the sample, but according to the 1990 census, about 26,500 Eskimos and Aleuts lived in States other than Alaska. It is not possible, however, to

distinguish in the data set between American Indians and Alaska Natives. The stratified systematic sample drawn included 1,480 live births, about 1 of every 6 eligible births.

In conducting a survey, to oversample is to modify a random probability sample to include greater numbers of the oversampled group than would have been selected based on that group's proportion in the general population or survey universe. Oversampling is frequently performed to expand the numbers of certain less numerous groups so that they can be studied in the same detail as larger groups in the population. Oversampling increases the amount of data obtained in the survey on racial or ethnic minorities, those in selected age groups, or individuals with specific demographic characteristics, such as income or education. The smaller the group and the rarer the event to be studied, the larger the sample must be. Oversampling permits selected expansion of the sample, rather than increasing the sample on a uniform basis.

The survey methods of NMIHS, which have been described in detail (4), were followed for the Urban Indian Oversample. Briefly, a 35-page questionnaire was mailed to the mothers, followed by a second mailing to nonrespondents of the questionnaire and a postcard reminder. Attempts were made to contact nonrespondents through telephone and personal interviews by the Bureau of the Census, with whom NCHS had contracted to conduct the data collection. The mothers' questionnaire included questions on the locations, frequency, and content of prenatal care; maternal and paternal demographic characteristics; hospitalizations before and after delivery; and infant health.

To collect information on a variety of clinical and economic variables, questionnaires were sent separately to prenatal care providers and hospitals of delivery that were identified by respondents. Nonresponding hospitals and prenatal care providers were sent a second mailing and up to three telephone calls were made. The American Medical Records Association, with whom NCHS had contracted, attempted to obtain medical records from nonresponding hospitals and to complete survey questionnaires from medical record reviews. However, only information from the birth certificates and the mothers' questionnaires were included in our study.

Response rates. The response rate among the originally selected sample was 51.6 percent (763 completed questionnaires of 1,480 selected). However, as shown in table 1, a number of problems occurred that directly affected the sample. There were no respondents in five States: Montana and Oklahoma

Table 1. Sample size, number of respondents, and response rates for the Urban Indian Oversample, 1988 National Maternal and Infant Health Survey

State	Sample size	Respondents	Nonrespondents	Response rate (percent)
Arizona ¹	227	152	75	67.0
California ²	502	248	254	70.7 ²
Colorado.....	27	19	8	70.4
Illinois.....	18	13	5	72.2
Iowa.....	13	10	3	76.9
Kansas.....	50	15	35	30.0
Massachusetts.....	11	6	5	54.6
Michigan.....	21	17	4	81.0
Minnesota.....	130	97	33	74.6
Montana ³	0
Nebraska ⁴	22	...	22	...
Nevada ⁴	24	...	24	...
New Mexico.....	73	49	24	67.1
New York City.....	34	14	20	41.2
Oklahoma ³	0
Oregon.....	44	6	38	13.6
South Dakota ⁵	29	...	29	...
Texas.....	35	28	7	80.0
Utah.....	43	32	11	74.4
Washington.....	122	11	111	9.0
Wisconsin.....	55	46	9	83.6
Total.....	1,480	763	717	51.6
Adjusted total ⁶	1,254	763	491	60.8

¹Unmarried mothers were not contacted in Arizona.

²151 additional certificates received by the Bureau of the Census were not included in the sample and are not included in the response rate (see text).

³State did not approve the survey.

⁴Birth certificates not provided by State.

⁵State retracted clearance after survey began.

⁶Excluding States with no respondents and 151 California birth certificates not received.

failed to approve the NMIHS in time to be included in the survey, South Dakota retracted clearance after the survey began, and Nebraska and Nevada did not respond for reasons unknown. Oregon and Washington had extremely low response rates (13.6 percent and 9.0 percent) (at least in part because of a requirement in those States for the mother's approval of use of the birth certificates). Although responses from those States cannot be assumed to be representative, they are included in this report.

In addition, 151 birth certificates in California were received by the Bureau of the Census too late for mothers to be included within the time frame allotted for the completion of the survey. Because NCHS did not maintain a record of the California birth certificate numbers, it is not possible to determine from birth certificate data whether the cases excluded from the sample were in any way different from those that were included. However, because the excluded cases were excluded primarily because the births took place toward the end of 1988, and the California cases that were included were randomly selected during the earlier months of the survey, we do not believe that the exclusion of the 151 cases introduced significant bias into the sample. When the

original sample of 1,480 is reduced by deleting birth certificates from States not participating in the survey and the 151 California birth certificates described, the resulting adjusted sample size is 1,254. The overall response rate, based on the adjusted sample size, was 60.8 percent (763 completed questionnaires of 1,254 birth certificates forwarded to the Bureau of the Census).

Imputation and weighting. Missing data were imputed by NCHS for selected variables in the NMIHS. However, because of the low response rates, we did not use imputed data in our analyses of the Urban Indian Oversample. We used imputed data for analyses of the U.S. natality sample, although we excluded women whose self-reported race was imputed (described subsequently). The complete NMIHS includes a weight for each record based on the probability of selection, an adjustment for sampling, a nonresponse adjustment, and a poststratification adjustment. The purpose of those weights is to allow extrapolation of results to all live births in the United States during 1988. Inherent in the weighting scheme is the assumption that survey respondents are not appreciably different from survey

Table 2. Demographic and economic characteristics of respondents to the Urban Indian Oversample, 1988 National Maternal and Infant Health Survey (NMIHS), and respondents to the national sample of NMIHS who lived in metropolitan counties, by mother's reported race

Characteristics	U.S. Birth File (metropolitan county residents only)		Urban Indian file	
	White (N=3,489)	Black (N=3,849)	American Indian (N=444)	Number of responses ¹
Mean age (in years)	27.1	24.4	25.1	444
Percent married ²	81	32	40	325
Mean parity	2.3	2.6	2.9	442
12 or more years of school (percent)	84	73	67	442
Household income in year before delivery:				
Percent less than \$10,000	15	46	45	} 375
Percent more than \$40,000	32	10	10	
Proportion with any insurance or HMO coverage during pregnancy (percent)	75	50	51	438
Proportion for whom Medicaid paid for any of prenatal or obstetrical care (percent)	15	48	29	436

¹Numbers of responses for American Indians exclude imputed data.
²Excludes Arizona, where unmarried women were not surveyed.

NOTE: Percentages may not add because of rounding.

Table 3. Selected characteristics of prenatal care among respondents to the Urban Indian Oversample, 1988 National Maternal and Infant Health Survey (NMIHS), and respondents to the national sample of NMIHS who lived in metropolitan counties, by mother's reported race

Prenatal care characteristic	U.S. Birth File (metropolitan county residents only)		Urban Indian File	
	White	Black	American Indian	Number of responses ¹
Period during which care was initiated, as recorded on birth certificate:				
Percent during months 1—3	82	60	60	} 444
Percent during months 4—6	13	27	26	
Percent during months 7—9	2	6	8	
No care	1	4	2	
Not stated	2	4	5	
No care, as reported by mother on survey response	1	4	3	444
Proportion of women who reported that it was hard to get prenatal care	13	16	23	435
Mean number of visits recorded on birth certificates, excluding those with no care	12	10	10	326

¹Numbers of responses for American Indians exclude imputed data.

NOTE: Percentages may not add because of rounding.

nonrespondents. Because of the relatively low response rate in the Urban Indian Oversample, and the fact that a large proportion of urban AI women were not represented among the respondents, it is not appropriate to extrapolate from the survey respondents to the population that was originally intended to be represented. However, we examined three weighting strategies to determine if the reported differences among AI women and women of other races were appreciably modified. The first weighting strategy accounted only for the probability of selection based on systematic sampling of vital records. The second added an adjustment for response rate when States were divided into four large groups aggregated on the

basis of geography and number of respondents. The third added an adjustment for the 151 birth certificates from California that were not included in the survey. None of those strategies provided results that would alter conclusions based on the unweighted data from the Urban Indian Oversample, whether compared with weighted or unweighted data from the U.S. natality file. Thus, the results we describe from the Urban Indian Oversample are unweighted, although survey weights assigned in the public use file were used for data from the entire U.S. natality file.

Analyses. By definition, women selected for the Urban Indian Oversample lived in metropolitan

counties. We therefore compared the responses of women from the Urban Indian Oversample to those of the respondents from the national natality sample who, according to the birth certificates, resided in standard metropolitan statistical areas or in New England County Metropolitan Areas (5–7). Of the respondents in the national natality sample, 78.7 percent (7,835 of 9,953) lived in metropolitan counties.

Results

Race. Both parents were listed as AI on 144 of 763 (18.9 percent) birth certificates in the Urban Indian Oversample; only the mother was recorded as AI on 390 (51.1 percent), and only the father was recorded as AI on 229 (30 percent). There were discrepancies between maternal and paternal race reported by mothers on the survey instrument and parental race recorded on the birth certificate. Among the survey respondents, 534 women were listed as AI on the birth certificate. However, 93 (17.4 percent) of those women listed another race in responding to the survey question “Which one of these groups *best* describes your racial background?” (76 listing white, 10 listing black, and 7 listing Asian or Pacific Islander). (On the public use file of the Urban Indian Oversample, the mother’s reported race is imputed to be AI for seven respondents and white for two respondents.) Among 373 fathers listed on the birth certificate as AI, the mothers reported that 92 (24.7 percent) were a race other than AI (80 white, 6 black, and 6 Asian or Pacific Islander). Despite the fact that birth certificates were chosen for the sample only if either the father or mother was recorded as AI, neither the father nor the mother was reported by survey respondents to be AI for 172 (22.5 percent) of the Urban Indian Oversample.

In the national sample, only 59 (61.5 percent) of 96 women who reported themselves to be AI for the survey were recorded as AI on the birth certificate; 29 (30.2 percent) were recorded as white, and 8 (8.3 percent) were recorded as black. Concordance between mothers’ self-reported race and the birth certificate was higher in nonmetropolitan counties (self-reported AI women were recorded as AI in 71.6 percent of cases) than in metropolitan counties (self-reported AI women were recorded as AI in 53.7 percent of cases) in the national sample. For our study, self-reported race of the mother from the questionnaire, rather than race as reported on the birth certificate, was used. Of 763 respondents, 444 in the Urban Indian Oversample reported themselves to be AI on the questionnaire, 269 as white, 18 as

black, and 14 as Asian or Pacific Islander; race was not stated for the remaining 18 women.

In almost all cases, the data for AI from the Urban Indian Oversample are similar to those for urban AI selected in the national sample. Subsequent AI data in this report are derived from the 444 respondents in the Urban Indian Oversample who reported themselves to be AI. All comparison data for whites and blacks refer to weighted responses of women from the U.S. natality survey residing in metropolitan counties who reported themselves as members of those races.

Demographic and Socioeconomic Characteristics

Selected demographic and socioeconomic characteristics of respondents in the Urban Indian Oversample and the national sample are shown in table 2. Indian women living in urban areas were slightly younger than white women, but slightly older than black women. The mean parity for Indians in urban areas was 2.9, compared with 2.3 for whites and 2.6 for blacks. After exclusion of the State of Arizona, where unmarried mothers were not surveyed, AI mothers were less likely to report being married (40 percent) than were whites (81 percent), but were more likely to report being married than were blacks (32 percent).

The total household income in the 12 months before delivery was lower for AI women than for white women. More than 45 percent of AI and black respondents, compared with 15 percent of white respondents, reported an annual household income of less than \$10,000. Conversely, only 10 percent of AI and black women, compared with 32 percent of white women, reported an annual income of \$40,000 or more. About half of AI women and black women reported having any insurance or HMO coverage during pregnancy, while three-quarters of white women made such a report. However, while 48 percent of blacks reported that Medicaid paid for some part of their prenatal care, delivery, or hospital stay, the proportions were lower for AI (29 percent) and white (15 percent) women.

Among those with annual household incomes less than \$10,000, 68 percent of black women, 54 percent of white women, and 45 percent of AI women reported Medicaid use. Thus, despite having a low rate of health insurance coverage (similar to that for blacks) and a high proportion of households with annual incomes less than \$10,000, AI were far less likely than blacks to have Medicaid coverage. Payment by the IHS does not account for that

Table 4. Alcohol, tobacco, and cocaine use of respondents to the Urban Indian Oversample, 1988 National Maternal and Infant Health Survey (NMIHS), and respondents to the national sample of NMIHS who lived in metropolitan counties, by mother's reported race (percentages)

Substance use	U.S. Birth File (metropolitan county residents only)		Urban Indian File	
	White	Black	American Indian	Number of responses ¹
Women reporting consumption of alcoholic beverages in the 12 months before delivery (drinkers)	54	28	45	442
Drinkers who consumed 1 or more drinks per week after learning that they were pregnant.....	8	16	16	200
Women who smoked cigarettes in the 12 months before delivery (smokers).....	32	27	35	443
Smokers who quit for at least 1 week during pregnancy.....	57	49	64	152
Women who reported using cocaine in the 12 months before delivery.....	2	3	5	438
Used cocaine 1 or more times a month after learning they were pregnant	9	59	25	20

¹Numbers of responses for American Indians exclude imputed data.

NOTE: Percentages may not add because of rounding.

Table 5. Planning status of the pregnancy, respondents to the Urban Indian Oversample, 1988 National Maternal and Infant Health Survey (NMIHS), and respondents to the national sample of NMIHS who lived in metropolitan counties, by mother's reported race

Status	U.S. Birth File (metropolitan county residents only)		Urban Indian File	
	White	Black	American Indian	Number of responses ¹
Percent planned.....	62	35	48	} 434
Percent mistimed.....	33	49	44	
Percent unwanted.....	5	15	8	

¹Number of responses for American Indians exclude imputed data.

NOTE: Percentages may not add because of rounding.

difference; only 7 percent of AI reported that IHS paid for any part of their prenatal care or delivery.

Prenatal care. AI women were more likely to report that it was hard to obtain prenatal care than were white or black women (table 3). They were also less likely to obtain prenatal care in the first trimester (60 percent) than whites (82 percent), although a similar proportion of blacks obtained first-trimester prenatal care. A greater proportion of AI and black women reported obtaining no prenatal care than did whites. Among those who did obtain prenatal care, the mean number of prenatal visits was higher for whites (11.7 visits) than for AI women (9.6 visits).

AI women were less likely than white or black women to have their first prenatal visit in a private office. Conversely, they were more likely to have their visit in a community health center compared to whites or blacks. Indian health clinics were not

separately identified on the questionnaire, so it is not possible to determine the proportion of urban Indian women who sought prenatal care at those facilities.

Personal habits and pregnancy planning status. A lower proportion of AI women (45 percent) than of white women (54 percent) reported drinking alcohol in the 12 months before delivery, although this proportion was even lower for black women (28 percent) (table 4). However, among those who did report drinking, a higher proportion of AI (16 percent) and black (16 percent) mothers reported consuming one or more drinks weekly after finding out they were pregnant than of white mothers (8 percent). Five percent of AI women reported consuming six or more drinks weekly after finding out they were pregnant; less than 1 percent of whites and 4 percent of blacks made such a report. Thus, while the overall prevalence of alcohol consumption

before pregnancy among AI women does not appear to exceed that among white women, AI are more likely to report continued regular consumption of alcohol during pregnancy.

The proportion of women who smoked cigarettes in the 12 months before delivery was similar for AI women (35 percent) and white women (32 percent), but slightly lower for black women (27 percent). However, a higher proportion of AI smokers (64 percent) than of white smokers (57 percent) or black smokers (49 percent) quit smoking for at least 1 week during pregnancy. AI smokers had fewer cigarettes per day both before (11.7 per day) and during pregnancy (6.8 per day) than white smokers before (16.6 per day) and during pregnancy (9.0 per day).

The prevalence of reported cocaine or crack use in the 12 months before the women learned that they were pregnant was low for all races (5 percent for AI women, 2 percent for whites and 3 percent for blacks). Twenty-five percent of AI and 59 percent of black cocaine users, compared with 9 percent of white cocaine users, continued to use cocaine one or more times a month after learning of their pregnancies.

The reported planning status of the index pregnancy was different among races (table 5). While 5 percent of white mothers reported that their pregnancies were unwanted, the comparable rates were higher for AI (8 percent) and black (15 percent) mothers. Sixty-two percent of white women wanted to become pregnant just before they became pregnant, as did 48 percent of AI and 35 percent of black women.

NMIHS included a brief self-report scale of depressive symptomatology, the Center for Epidemiologic Studies Design Scale (CES-D), which has been widely used in epidemiologic studies (8). Unlike most of the responses, which focused on the peripartum period, responses to the CES-D were focused on the week before the survey. High scores on the scale represent a high number of depressive symptoms. Scores of 16 and higher, while not equivalent to a clinical diagnosis of depression, are considered to represent a current depressive state (9).

The mean CES-D score for AI women (13.3) exceeded that for white women (9.5), although it was lower than that for black women (14.0). Among AI women, the proportion of respondents with scores exceeding 16 (32 percent) was greater than that among white women (20 percent). The proportion among black women was 35 percent. However, the validity of the CES-D scale has not been demonstrated among AI women, so the magnitude of the differences may or may not represent clinically important differences in depressive symptoms (9).

'AI women reported more difficulty in obtaining prenatal care than did black women, and they were less likely to have Medicaid coverage despite low incomes. Thus, health programs to improve access to maternal and child health services, with a special emphasis on early prenatal care, should be directed toward urban AI women.'

Discussion

Because of the relatively low response rate in participating States (60.8 percent) and the substantial proportion of Indian births not represented in the survey, it is not possible to generalize these findings to all urban AI women. However, the Urban Indian Oversample of the 1988 NMIHS may be useful in describing the health status and access to care of urban AI mothers in several ways.

The Urban Indian Oversample provides new insight into the issue of racial self-identification among AI women. There were substantial discrepancies between AI maternal race as recorded on the birth certificates and as reported on the questionnaire. At least two alternative explanations may account for these findings. First, if a birth certificate was completed by a person other than the mother, the certifier may have erroneously recorded the race. Previous reports from some States have found a high rate of nonconcordance between AI race as recorded on linked infant birth and death certificates (2, 10, 11); for example, a high proportion (as many as 30 percent) of infants born AI were coded to another race on the death certificate. Implicit in the studies has been the assumption that because mothers are more likely to participate in the completion of the birth certificate than the death certificate, the infant's race as defined by the birth certificate is more likely to be consistent with maternal self-identification. However, in the 1988 NMIHS, more than 40 percent of women who identified themselves as AI on the questionnaire were listed as another race on the birth certificate. It is not possible to determine the extent to which temporal differences in maternal racial self-identification account for the discrepancy, but those differences suggest that the current system of vital records may result in assignment of some AI births to other racial groups.

Second, mothers in the Urban Indian Oversample who filled out the birth certificate and identified themselves as AI may not have identified themselves as AI in the survey. In the case of birth certificates, maternal identification as AI may confer benefits related to Tribal membership or eligibility for health care to the infant. Women of less than 100 percent Indian heritage may have chosen to identify themselves as members of another race in a survey (perhaps administered by a non-Indian interviewer) in which there are no immediate implications to the respondent regarding racial self-identification.

A notable finding of the survey is that, in many cases, the risk factors and personal characteristics of urban AI women are remarkably similar to those of urban black women. Although there are some exceptions (for instance, higher rates of alcohol consumption among AI), risk factors, such as low income, late onset of prenatal care, and a high proportion of unintended pregnancy, are likely to have similar adverse effects among AI and black women and may account for some of the disparity between AI and white infant mortality rates.

The data from the Urban Indian Oversample of the NMIHS are consistent in many respects to previous reports describing AI in urban areas. For instance, the finding of low Medicaid enrollment despite low income was found in a study of clients of two urban American Indian clinics in Kansas and Oklahoma (12). The high rate of unintended pregnancy among AI women in the Urban Indian Oversample of the NMIHS is consistent with the finding that a higher proportion of American Indian women than of white women were unhappy or ambivalent about their pregnancies in a study of low income women in Minneapolis (13).

About 20 percent of AI respondents were from Arizona. Unmarried mothers in Arizona were not sampled, and unmarried mothers typically have a higher risk profile than married mothers. Therefore, the findings from the Urban Indian Oversample may be skewed toward a more favorable risk profile than would have been reflected if unmarried women in Arizona had been included.

The Urban Indian Oversample of the 1988 NMIHS provides an opportunity for researchers to examine a number of maternal and child health risk factors among urban AI women. Future studies of the data set should explore interactions among various risk factors. It is clear from the Urban Indian Oversample that many AI women comprise an at-risk minority population. Much of the risk is likely associated with social and economic factors, such as poverty, rather than with biological factors associated with Indian

heritage. However, approaches targeted toward improving access and outcomes among black women, a minority group widely recognized as having a high prevalence of multiple adverse health risk factors, may not be adequate for reaching AI women. AI women reported more difficulty in obtaining prenatal care than did black women, and they were less likely to have Medicaid coverage despite low incomes. Thus, health programs to improve access to maternal and child health services, with a special emphasis on early prenatal care, should be directed toward urban AI women.

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